NUCLEAR ENERGY INSTITUTE

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December 20, 2002

Mr. James E. Lyons
Director, New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Resolution of Generic Topic ESP-7 (Meeting Section 10 CFR 52.17(a)(1))

Dear Mr. Lyons:

In several public meetings between July 17 and December 5, 2002, we discussed generic early site permit topic ESP-7, which concerns how ESP applications that use the PPE approach in lieu of specific design information will comply with the requirements of Section 52.17(a)(1). This topic relates closely to generic topic ESP-6, *Plant Parameters Envelope (PPE) Approach for ESP,* which is the subject of a separate issue resolution letter for that topic, also dated December 20, 2002.

In accordance with the protocol established for documenting resolution of generic ESP issues, we request that, by reply to this letter, the NRC confirm the understandings and expectations that resulted from these interactions. These are identified below and described more fully in Enclosure 1. To provide for timely resolution of generic issues and continued progress toward submittal of ESP applications in mid-2003, we request that NRC respond by February 1, 2003.

Understandings/Expectations

1. ESP-7 pertains only to the required ESP safety assessment of radiological dose consequences of postulated accidents. The approach described below reflects the specific requirements of Section 52.17(a)(1). As discussed during our December 5th public meeting, other radiological-related ESP reviews, including safety and environmental reviews of radiological releases during normal operation and environmental review of design basis accident consequences, will be addressed separately by other means in accordance with applicable requirements and guidance.

2. Chi/Q is the site characteristic associated with meeting Part 100 requirements, and ESP applicants using the PPE approach in lieu of specific design information will comply with Section 52.17(a)(1) by determining the site ?/Q, including the effect of SSCs, if any, that bear significantly on the result. ESP applications are not required to include complete radiological dose consequence calculations.

3. For a combined license, the site ?/Q will be combined with the release history information provided in a design certification, or approved during the COL review of an uncertified design, to determine whether Part 100 requirements are met. If the site ?/Q is conservative with respect to that assumed in a referenced design certification, then the site/design combination meets Part 100 requirements.

An updated status listing of generic ESP topics is provided as Enclosure 2 for information.

We look forward to your confirmation of the understandings and expectations described above related to ESP-7. If you have any questions concerning this request, please contact me (rls@nei.org or 202-739-8128) or Russ Bell (rjb@nei.org or 202-739-8087).

Sincerely,

Original Signed By:

Ron Simard

Enclosures

c: Ronaldo V. Jenkins, NRC/NRR
Document Control Desk

ESP-7 – Enclosure 1
December 20, 2002

Analysis of Section 52.17(a)(1) Compliance for ESP Applications Under the PPE Approach

1. Pertinent NRC Regulations:

- Section 52.17(a)(1) states in part:

  "...The application must also contain a description and safety assessment of the site on which the facility is to be located. The assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in Section 50.34(a)(1) of this chapter. Site characteristics must comply with Part 100 of this chapter."

- Similarly, 10 CFR 100.21(c)(2) requires site atmospheric dispersion characteristics be evaluated and dispersion parameters established such that:

  "Radiological dose consequences of postulated accidents shall meet the criteria set forth in Section 50.34(a)(1) of this chapter for the type of facility proposed to be located at the site."

- Lastly, the radiological consequence evaluation factors identified in Section 50.34(a)(1) are as follows:

  (ii)(D)(1) An individual located at any point on the boundary of the exclusion area for any 2 hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE) (footnote omitted).

  (2) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE);

2. Discussion:

Compliance with the radiological dose consequence criteria in Sections 100.21 and 50.34(a)(1) for postulated accidents is a requirement under Subpart A, Early Site Permits, Subpart B, Standard Design Certification, and Subpart C, Combined Licenses. As indicated below, elements of this requirement can be addressed as part of ESP and DC, however, the determination that radiological dose consequence criteria are met

can only be made at COL when both the site and design are known and interface issues can be evaluated.

- An ESP application determines the atmospheric dispersion characteristics for a particular site (i.e., the site characteristic associated with Part 100 compliance)

- A standard design certification application postulates site atmospheric dispersion characteristics (?/Q) for an unspecified generic site and calculates radiological dose consequences associated with the structures, systems and components of the particular design (i.e., design characteristics associated with Part 100 compliance). This calculation demonstrates that any site with a ?/Q equal to or conservative with respect to the postulated ?/Q, will have dose consequences that meet Section 50.34(a)(1) for the design being certified.

- A Combined License application integrates the ?/Q for a particular site with the design characteristics for the specified plant and may do so via reference to an ESP and/or a DC. If an ESP and DC are referenced, the applicant must provide information sufficient to demonstrate that the design of the facility falls within the parameters specified in the early site permit [Section 52.79(a)(1)]. If the postulated ?/Q in the design certification falls within the actual ?/Q in the early site permit, the specific reactor/site combination meets the radiological consequence evaluation factors identified in Sec. 50.34(a)(1). If the postulated ?/Q does not fall within the actual ?/Q, compliance with the radiological criteria must be demonstrated in the combined license application.

3. Compliance with Section 52.17(a)(1):

As explained above, compliance with the radiological dose consequences in Sec. 50.34(a)(1) as referred to by Sec. 52.17(a)(1) and Sec. 100.21(c)(2) is determined by the integration of the evaluations performed in the early site permit, standard design certification, and combined license applications.

52.17(a)(1) also states that the ESP safety assessment "must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in Section 50.34(a)(1)..."

The calculated dose consequences of postulated accidents is dependent on ?/Q (a site characteristic) and release history (a design characteristic):

- Chi/Q is a function of radiological release point, building wake effects, distance to exclusion area boundary and low population zone boundary, historical

meteorological data associated with the site, and atmospheric dispersion models.

- Release history is a function of source term, containment characteristics, filtration system characteristics, other mitigation system characteristics, release timing, and accident type.

For an Early Site Permit application, the acceptability of the site is dependent on the site characteristic of ?/Q, including any assumptions on SSCs that bear significantly on the calculation of ?/Q such as elevated release point, and building locations associated with assumed wake affects. Based on NRC guidance for calculating ?/Q, we expect that for most ESP applicants, there will be no such dependencies on SSCs that affect the calculation of ?/Q. This is true of the pilot ESP applicants, who, consistent with applicable guidance in RG 1.145 for calculating ?/Q, are each assuming ground level releases with no wake effects.

For a standard design certification application, the acceptability of the design is dependent on the release history, including any assumptions on SSCs inherent in the calculation of the release history. The accompanying dose calculations postulate a site ?/Q which will be compared with an actual site characteristic in a combined license application.

If an ESP application includes release history information for a certified standard design, the integration of ?/Q with release history information and the determination that the specified site/design combination meets Part 100 requirements may be accomplished at ESP.

For a combined license application, the acceptability of the site/design combination (i.e., meeting Part 100 requirements) is dependent on the site ?/Q in the ESP and the release history for the selected design. If the site ?/Q is conservative with respect to that assumed in a referenced design certification, then the site/design combination meets Part 100 requirements.

4. Summary:

Chi/Q is the site characteristic associated with meeting Part 100 radiological dose consequence requirements, and compliance with Sec. 52.17(a)(1) in the ESP application is accomplished by determining the site ?/Q, including the effect of SSCs, if any, that bear significantly on that result. At COL, the site ?/Q is combined with the release history information provided in a design certification, or approved during the COL review of an uncertified design, to determine whether Part 100 requirements are met for the site/design combination.

ESP-7 – Enclosure 2
December 20, 2002

Status of Generic ESP Interactions

ESP Topic Higher priority topics shaded	Initial Discussion	Resolution Pending	Discussions Ongoing	Next Discussion	NEI Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Remarks
1. ESP application form & content	8/22		x	1/29					NRC provided TOC comparison on Oct. 16
2. ESP inspection guidance	4/24		x	1/29					• IMC-2501 issued; reflects QA open issue (see ESP-3) • ESP Review Std to be issued for use & comment by year end
2a. Pre-application interactions (voluntary nature, plans for local public mtgs & review fee structure)	4/24	x			11/26				
3. QA requirements for ESP information	5/28	x			12/20			2/1/03	
4. Nominal NRC review timeline	10/17		x	1/29					
5. Mechanism for documenting resolution of ESP issues	5/28				9/10	11/5			
6. Use of plant parameters envelope (PPE) approach	7/16	x			12/20			2/1/03	
7. Guidance for satisfying §52.17(a)(1) requirements	7/16	x			12/20			2/1/03	Related to ESP-6
8. Fuel cycle and transportation impacts (Tables S-3 & S-4)	9/25		x	1/29				3/1/03	
9. Criteria for assuring control of the site by the ESP holder				3/5					
10. Use of License Renewal GEIS for ESP	9/25	x							
11. Criteria for determining ESP duration (10-20 years)	12/5	x			12/20				

ESP Topic Higher priority topics shaded	Initial Discussion	Resolution Pending	Discussions Ongoing	Next Discussion	NEI Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Remarks
12. Guidance for evaluating severe accident mitigation alternatives under NEPA	8/22	x			12/20			2/1/03	
13. Guidance for ESP seismic evaluations	6/13		x	1Q03					2nd meeting on pilot demonstration activity planned for 1Q03
14. Applicability of Federal requirements concerning environmental justice				3/5					Evaluating related PFS decision by Commission
15. Appropriate level of detail for site redress plans	9/25	x			11/26				
16. Guidance for ESP approval of emergency plans				1/29					
17. Petition to eliminate duplicative NRC review of valid existing site/facility information									Staff recommendation pending on petition PRM-52-1
18. Petition to eliminate reviews for alternate sites, sources and need for power									Staff recommendation pending on petition PRM-52-2
18a Alternative site reviews	12/5	x			12/20			3/1/03	
19. Addressing effects of potential new units at an existing site				3/5					
20. Practical use of existing site/facility information	9/25	x			11/26				
21. Understanding the interface of ESP with the COL process.				3/5					
22. Form and content of an ESP	8/22		x	1Q03				2/1/03	NEI draft under consideration by NRC